Quarterly Eos Contract Report - Report #21

Period: July 1 - September 30, 1993

Remote Sensing Group (RSG), Optical Sciences Center, University of Arizona

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Report compiled by: K. J. Thome

Task Progress:

P. Slater and K. Thome travelled to Torrance, Calif. where Slater chaired the Defense Landsat Program Office's Workshop on Atmospheric Correction of Landsat Imagery June 29, 30 and July 1. Thome presented two papers at the workshop, the first summarizing the atmospheric aerosols workshop sponsored by Goddard Space Flight Center in May and the second describing preliminary plans for the atmospheric correction of ASTER. S. Biggar and Slater travelled to Pasadena for the ASTER Science Team meeting held July 14-16 where they described the current research activities of the RSG and their planned applications to ASTER. Slater travelled to Tokyo for the IGARSS '93 meeting August 17-20 where he co-chaired two sessions and presented a paper describing the solar-radiation-based calibration of SeaWiFS. Biggar, Slater, and Thome met September 16 at the RSG's facilities in Tucson with G. Geller, A. Kahle, and D. Nichols of JPL and H. Kieffer of the USGS in Flagstaff to discuss ASTER Level 1 processing in the United States. Biggar and Slater travelled to Washington, D. C. for the MODIS Science Team meeting September 27 to October 1 where Slater chaired meetings of the MODIS Calibration Working Group.

D. Gellman continued specifying the design of the mobile lab. The trailer and tow vehicle were specified and bids requested. He also performed numerous tasks in preparation for a mid-October field experiment at White Sands. This included work on the reflectomobile design to reduce shadow problems, to prevent failure of the space-frame joints, and to level the trailer. He also devised a method to cover the tow vehicle tires to reduce marking the test site's surface. Gellman began blacklab calibration measurements of our reflectance panels.

Biggar continued work on the first cross-calibration radiometer. He

began measuring several of our calibrated lamps for comparison with the recently received standard lamp from NIST. Biggar continued work on the first cross-calibration radiometer by upgrading the data collection software. Biggar upgraded the panel reflectance measurement and reduction software in conjunction with the blacklab work by Gellman. He also upgraded our data collection hardware and software in preparation of our October White Sands trip.

Thome prepared the Algorithm Theoretical Basis Document for the in-flight calibration of MODIS. He and Biggar prepared input for the MODIS Calibration Plan and submitted this to MCST. Biggar, Slater, and Thome emailed comments to Geller of JPL regarding the ASTER EEDSCD. Thome supplied comments to Geller regarding the calibration portion of the ASTER System Level Requirements Document. He also sent a revised Science Objectives to Nichols of JPL and began work on developing a new Statement of Work. Thome continued work on the atmospheric correction for ASTER in the solar-reflective portion of the spectrum. Related to this, he emailed comments regarding test criteria for the atmospheric correction to F. Palluconi of JPL. Thome met with R. Alley, C. Leff, and C. Voge to discuss plans for the atmospheric correction. It was agreed to modify the atmospheric correction to a look-up-table approach. It was also agreed that the RSG would supply software specifications and the look-up-table for the atmospheric correction while personnel at JPL would develop the code. Thome worked on the IR thermometers in preparation for the October White Sands trip.

M. Brownlee began work on data acquisition software for the BRDF camera. She also performed preliminary measurements with the camera in our blacklab. Preparations on the camera were made to use it during the October White Sands trip. B. Crowther worked on the SWIR spectroradiometer to prepare it for White Sands. A silicon fiber optic cable was obtained to allow the SWIR spectroradiometer to be used on the reflectomobile. An Exotech radiometer was ordered as was an Ocean Optics spectrometer. S. Recker performed all administrative tasks.

Problems/Corrective Actions:

From computer usage predictions it was determined that the originally proposed method for the atmospheric correction of ASTER in the solar-reflective would not be feasible. As mentioned above, it was decided to change the method to a look-up-table approach.

Problems have been encountered in accurately assessing the spectral transmittance of the interference filters for the silicon detector cross-calibration radiometer. Biggar designed hardware and ordered and received computer software for measuring filter spectral transmittance using the recently received Optronic monochromator system. He and Thome made preliminary transmittance measurements of the radiometer's filters. Biggar also investigated using the nearly refurbished Cary-14 spectroradiomter for this purpose.

Anticipated Actions:

The RSG will travel to White Sands Missile Range from October 15-22 for calibration of SPOT-2, newly launched SPOT-3, JERS-1, and Landsat 5. We plan to fly several radiometers, including the SWIR spectroradiometer, as part of the SPOT-2 calibration. This trip will also be used to test the improvements to the reflectomobile and also to test the BRDF camera. Another White Sands experiment is anticipated for November as well.

Gellman will continue work on the mobile lab as well as investigate mounting the reflectomobile space-frame to the tow vehicle. Biggar will continue characterizing the cross-calibration radiometer's filters. Biggar and Thome are planning to travel to Santa Barbara to repeat the solar-radiation-based calibration of SeaWiFS performed last March. Thome will develop the software specifications for the atmospheric correction of ASTER. The Statement of Work and revised Science Computing Facilities document will be completed. Brownlee will examine the data collected at White Sands from the BRDF camera and evaluate its performance.

Slater will attend a workshop on MODIS calibration at GSFC on November 1 and 2. He and Thome will attend the ASTER Science Team meeting in Tokyo during the week of November 8. Biggar and Slater will attend the MODIS CDR in Santa Barbara during the week of December 6.